

Claims

1. A dental composition comprising a fluorescent whitening agent and a dentally acceptable diluent or carrier.

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2. A dental composition as claimed in Claim 1, which is formulated as a toothpaste, mouthrinse, toothgel, tooth paint or dental gel.

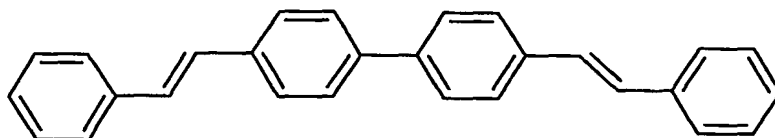
3. A dental composition as claimed in Claim 1 or Claim 2, wherein the fluorescent whitening agent absorbs light of wavelength less than 380nm and re-emits light in the wavelength range 400nm to 450nm.

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4. A dental composition as claimed in any preceding claim, wherein the fluorescent whitening agent is selected from the group consisting of

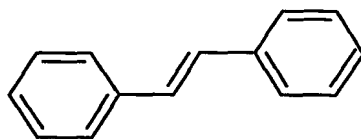
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a) bis-styrylbiphenyl compounds having the following chromophore system:



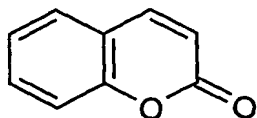
b) derivatives of stilbene having the following chromophore system:

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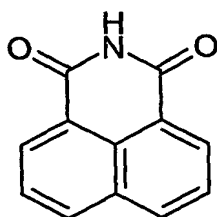


c) coumarins having the following chromophore system:

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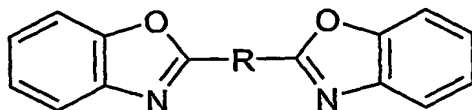


d) naphthalimide derivatives having the following chromophore system:



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e) benzoxazole derivatives having the following chromophore system:

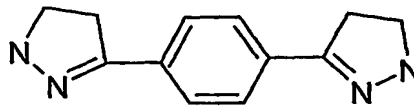
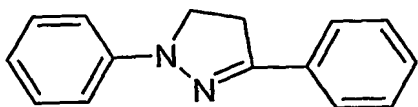


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in which R represents a conjugated group; and

f) pyrazoline and bis-pyrazoline derivatives having the following chromophore systems:

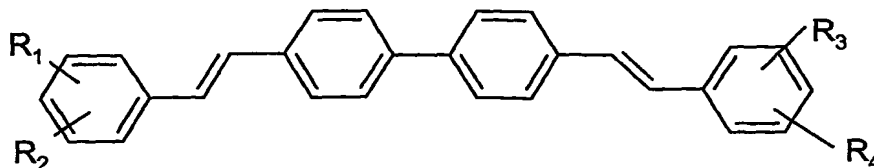
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5. A dental composition as claimed in any preceding claim, wherein the fluorescent whitening agent is a bis-styrylbiphenyl compound of the general formula:

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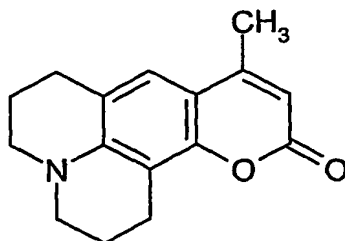


in which R_1 is $-\text{SO}_3\text{M}$ and R_2 , R_3 and R_4 , which may be the same or different, are
 5 selected from R_5 , $-\text{SO}_3\text{M}$, halogen (particularly Cl), $-\text{CN}$, $-\text{OC}(=\text{O})\text{R}_5$, $-\text{COOR}_5$, $-\text{SO}_2\text{N}(\text{R}_5)_2$ and $-\text{CON}(\text{R}_5)_2$, wherein R_5 represents hydrogen or C_{1-8} alkyl and M represents hydrogen or a Group I metal, eg Na, K or Li.

6. A dental composition as claimed in Claim 5, wherein R_3 is the same as R_1 ,
 10 and R_2 and R_4 are the same and are selected from R_5 , halogen, $-\text{CN}$, $-\text{OC}(=\text{O})\text{R}_5$, $-\text{COOR}_5$, $-\text{SO}_2\text{N}(\text{R}_5)_2$ and $-\text{CON}(\text{R}_5)_2$.

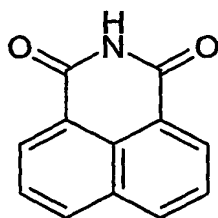
7. A dental composition as claimed in Claim 4, wherein the fluorescent
 whitening agent is selected from the group consisting of disodium 4,4'-bis[(4-
 15 anilino-6-morpholino-1,3,5-triazin-2-yl)amino]stilbene-2,2'-disulfonate, disodium
 4,4'-bis[[4-anilino-6-(N-methyl-N-2-hydroxyethyl)amino-1,3,5-triazin-2-yl]
 amino]stilbene-2,2'-disulfonate, and disodium 4,4'-bis[(4-anilino-6-methylamino-
 1,3,5-triazin-2-yl)aminolstilbene-2,2'-disulfonate.

8. A dental composition as claimed in Claim 4, wherein the fluorescent
 20 whitening agent is:



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9. A dental composition as claimed in Claim 4, wherein the fluorescent whitening agent is:



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10. A dental composition as claimed in Claim 4, wherein the fluorescent whitening agent is a bis-styrylbiphenyl compound.

10 11. A dental composition as claimed in Claim 10, wherein the fluorescent whitening agent is 4,4'-bis(2-sulfostryl)biphenyl or a salt or other soluble derivative thereof.

12. A dental composition as claimed in Claim 11, wherein the fluorescent whitening agent is disodium 4,4'-bis(2-sulfostryl)biphenyl.

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13. A dental composition as claimed in any preceding claim, wherein the concentration of fluorescent whitening agent in the composition is less than 1,000 ppm.

20 14. A dental composition as claimed in Claim 13, wherein the concentration of fluorescent whitening agent in the composition is in the range 50ppm to 500ppm.

15. A dental composition as claimed in any Claim 13, wherein the concentration of fluorescent whitening agent in the composition is less than 100ppm.

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16. A dental composition as claimed in Claim 15, wherein the concentration of fluorescent whitening agent in the composition is in the range 5ppm to 50ppm.

5 17. A dental composition as claimed in any preceding claim, wherein the composition comprises an additional tooth whitening agent in addition to the fluorescent whitening agent.

10 18. A dental composition as claimed in Claim 17, wherein the additional tooth whitening agent is a bleaching agent.

19. A dental composition as claimed in Claim 18, wherein the bleaching agent is a peroxide.

15 20. A dental composition as claimed in Claim 19, wherein the peroxide is hydrogen peroxide or a compound that generates hydrogen peroxide in use.

21. A dental composition as claimed in Claim 18, wherein the bleaching agent is a chlorite bleaching agent.

20 22. A method for improving or enhancing the appearance of the teeth, in particular for whitening of the teeth, which method comprises application to the teeth of a dental composition as claimed in any one of Claims 1 to 14.

25 23. A method as claimed in Claim 22, wherein the method further comprises the application to the teeth of an additional tooth whitening agent.

24. A method as claimed in Claim 23, wherein the additional tooth whitening agent is a bleaching agent.

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25. A method as claimed in Claim 24, wherein the bleaching agent is a peroxide.

26. A method as claimed in Claim 25, wherein the peroxide is hydrogen
5 peroxide or a compound that generates hydrogen peroxide in use.

27. A method as claimed in any one of Claims 23 to 26, wherein application of the additional tooth whitening agent precedes application of the fluorescent whitening agent.

10 28. A method as claimed in any one of Claims 23 to 26, wherein application of the additional tooth whitening agent is simultaneous with application of the fluorescent whitening agent.

15 29. A method as claimed in any one of Claims 23 to 26, comprising a first stage in which the fluorescent whitening agent and the additional tooth whitening agent are applied, simultaneously or sequentially, by a dental surgeon, and a second stage in which the fluorescent whitening agent and the additional tooth whitening agent are applied, simultaneously or sequentially, by the patient.

20 30. A method as claimed in Claim 29, wherein in the first stage the additional tooth whitening agent is applied first, followed by the fluorescent whitening agent.

25 31. A method as claimed in Claim 29 or Claim 30, wherein in the second stage, the additional tooth whitening agent and the fluorescent whitening agent are applied simultaneously.

32. A dental composition substantially as hereinbefore described with reference to any of the Examples.

33. A method for improving or enhancing the appearance of the teeth, in particular for whitening of the teeth, substantially as hereinbefore described.